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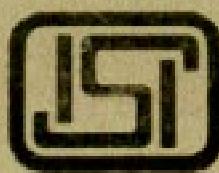
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*Indian Standard*  
SPECIFICATION FOR  
EDIBLE GROUNDNUT PROTEIN ISOLATE

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# Indian Standard

## SPECIFICATION FOR EDIBLE GROUNDNUT PROTEIN ISOLATE

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# Indian Standard

## SPECIFICATION FOR EDIBLE GROUNDNUT PROTEIN ISOLATE

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 30 September 1976, after the draft finalized by the Nutrition Sectional Committee had been approved by the Agricultural and Food Products Division Council.

**0.2** Groundnut protein isolate is well recognised as a rich source of dietary protein. Its properties like taste, odour and colour have led to its widespread use. Groundnut protein isolate, the process for the production of which has been standardized, is also being used in fairly large quantities in the preparations of biscuits, toffees, other confectionery and beverages.

**NOTE**—A process for the production of groundnut protein isolate has been developed at the Central Food Technological Research Institute, Mysore.

**0.3** One of the toxicants usually present in edible groundnut protein products is aflatoxin, produced by the fungus *Aspergillus flavus*. It is now well established that aflatoxin is harmful to human beings when ingested even in minute quantities. It therefore becomes imperative that the edible flour is produced under strictly controlled hygienic conditions. Under optimum conditions of growth, harvesting and drying, the toxin content may be almost negligible. At the same time several methods have been developed for detoxification of the aflatoxin present in edible groundnut flour by treatment with chemicals like ammonia, hydrogen peroxide and certain other oxidising agents. Simultaneously, these treatments tend to lower the nutritive value of the edible groundnut protein products through destruction of the sulphur amino acids. Therefore, preferred methods of making edible groundnut protein products of good nutritive value and low aflatoxin content consist either in treating groundnut pods in the field to avoid fungal contamination, or in manually removing fungus-affected kernels before processing the remainder, or in using groundnut naturally resistant to fungus. At present manual removal of fungus affected kernel is adopted for commercial production of edible groundnut protein isolates and products with an aflatoxin content well below the prescribed limit can be regularly obtained.

**0.4** This standard has been formulated in close collaboration with the Protein Foods and Nutrition Development Association of India. In the preparation of this standard, due consideration has been given to the provisions of the Prevention of Food Adulteration Act, 1954 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these rules, wherever applicable.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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## 1. SCOPE

**1.1** This standard prescribes the requirements and the methods of sampling and test for edible groundnut protein isolate.

## 2. REQUIREMENTS

**2.1 Raw Material** — Edible groundnut protein isolate shall be prepared either from expeller-pressed or solvent-extracted groundnut cake, or from fresh and cleaned groundnut kernels which have been decuticled after mild roasting.

**2.1.1** The expeller-pressed or solvent-extracted groundnut cake used for preparation of edible protein isolate shall be fresh and of good quality, and low in aflatoxin. The isolate shall be prepared from such cake by a suitable process, for example, by alkali solubilization of the protein, detoxification of aflatoxin, and precipitation of the protein through the addition of mineral acid. Thereafter, the isolate may be centrifuged, washed by redispersion in water and dried to powder.

**2.1.2** If groundnut kernels are used for preparation of edible protein isolate, they should be selected by either visual or ultraviolet light inspection, electronic sorting or other means so as to reduce the proportion of immature, shrivelled and mouldy kernels carrying high levels of aflatoxin. The selected kernels should be roasted mildly, and germs removed after blanching. The decuticled kernels are expelled in a screw press to yield a cake of a very pale brown colour. Any chemical and the water used in processing shall be of food-grade.

**2.2 Description** — The edible groundnut protein isolate shall be in the form of a dry powder, either spray dried, roller dried or dried in any other

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\*Rules for rounding off numerical values (revised).

suitable manner. It shall be of cream to grey colour, sweet taste, neutral in reaction, and free from rancid or any objectionable odour or taste. It should be free from insect or fungal infestation.

**2.2.1** Edible groundnut protein isolate shall be free from toxic contaminants such as castor husk or *MAHUA* oil cake when tested according to the methods prescribed in 11 and 12 of IS : 7874 ( Part I )-1975\*.

**2.3 Particle Size** — Unless otherwise agreed between the purchaser and the vendor, the material shall be of such fineness that, when tested by the method prescribed in Appendix A of IS : 4684-1975†, not more than 5 percent by mass shall be retained on 710-micron IS Sieve ( *see* IS : 460-1962‡ ) and not more than 20 percent by mass shall be retained on 500-micron IS Sieve.

**2.4 Hygienic Conditions** — The edible groundnut protein isolate shall be manufactured, packed, stored and distributed under hygienic conditions ( *see* IS : 2491-1972§ ).

**2.5** Edible groundnut protein isolate shall also comply with the requirements given in Table 1.

**TABLE 1 REQUIREMENTS FOR EDIBLE GROUNDNUT PROTEIN ISOLATE**

| SL<br>No. | CHARACTERISTIC   | REQUIREMENT | METHOD OF TEST<br>REF TO APPENDIX<br>IN IS : 4684-1975* |
|-----------|--|-------------|---|
| (1)       | (2)  | (3)         | (4)   |
| i)        | Moisture, percent by mass, <i>Max</i>                              | 6·0         | B   |
| ii)       | Crude Protein ( $N \times 6\cdot25$ ), percent by mass, <i>Min</i> | 86·0        | C   |
| iii)      | Total ash percent by mass, <i>Max</i>                              | 6·0         | D   |
| iv)       | Acid insoluble ash percent by mass, <i>Max</i>                     | 0·2         | E   |
| v)        | Fat, percent by mass, <i>Max</i>                                   | 1·0         | F   |
| vi)       | Crude fibre percent by mass, <i>Max</i>                            | 0·8         | H   |
| vii)      | Aflatoxin $\mu\text{g}/\text{kg}$ , <i>Max</i>                     | 60·0        | J   |

NOTE — Requirements given at Sl No. ( ii ) ( iii ) ( iv ) ( v ) and ( vi ) shall be 'on dry basis'.

\*Specification for edible groundnut flour ( expeller pressed ) ( *first revision* ).

\*Methods of sampling and tests for animal feeds and feeding stuffs: Part I General methods.

†Specification for edible groundnut flour ( expeller pressed ) ( *first revision* ).

‡Specification for test sieves ( *revised* ).

§Code for hygienic conditions for food processing units ( *first revision* ).

**2.6 Bacteriological Requirements** — The edible groundnut protein isolate shall be tested periodically to comply with the requirements given in Table 2.

**TABLE 2 BACTERIOLOGICAL REQUIREMENTS FOR EDIBLE GROUNDNUT PROTEIN ISOLATE**

| SL<br>No. | CHARACTERISTIC                            | REQUIREMENT | METHOD OF TEST<br>REF TO IS : |
|-----------|---|-------------|-------------------------------|
| (1)       | (2)                                       | (3)         | (4)                           |
| i)        | Total bacterial count per gm, <i>Max</i>  | 50 000      | 5402-1969*                    |
| ii)       | Coliform bacteria count per g, <i>Max</i> | 10          | 5401-1969†                    |
| iii)      | <i>Salmonella</i> sp                      | Nil         | 5887-1970‡                    |

\*Method for plate count of bacteria in foodstuffs.

†Methods for detection and estimation of coliform bacteria in foodstuffs.

‡Methods for detection of bacteria responsible for food poisoning and food-borne diseases.

### 3. PACKING AND MARKING

**3.1 Packing** — The material shall be packed in polyethylene or polyethylene-lined jute bags, or in clean tinplate containers. When packed in bags the mouth of each bag shall be either machine- or hand-stitched. If hand-stitched, the mouth shall be rolled over and stitched. The stitches shall be in two cross-rows with at least 14 stitches in each row.

**3.2 Marking** — The following particulars shall be marked or labelled on each container:

- Name of the material,
- Name and address of the manufacturer,
- Batch or code number,
- Net mass, and
- Date of manufacture.

**3.2.1** Each container may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution,

#### 4. SAMPLING

**4.1** Representative samples of the material shall be drawn and tested for conformity to this standard as prescribed in IS : 5315-1969\*.

#### 5. TESTS

**5.1** Tests shall be carried out as prescribed in **2.2.1, 2.3, 2.4** and Tables 1 and 2.

**5.2 Quality of Reagents** — Unless specified otherwise, pure chemicals and distilled water ( *see* IS : 1070-1960† ) shall be employed in the tests.

**NOTE** — 'Pure chemicals' shall mean chemicals that do not contain impurities which affects the test results.

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\*Methods of sampling for milled cereals and pulses products.  
†Specification for water, distilled quality (*revised*).

(Continued from page 2)

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**INDIAN STANDARDS  
ON  
NUTRITIOUS FOODS**

IS:

3137-1974 High protein mixes for use as food supplement (*first revision*)  
4684-1975 Edible groundnut flour (expeller pressed) (*first revision*)  
4874-1968 Cottonseed flour (expeller pressed) (*first revision*)  
4875-1975 Edible groundnut flour (solvent extracted) (*first revision*)  
4076-1968 Cottonseed flour (solvent extracted) (*first revision*)  
6108-1971 Edible sesame flour (solvent extracted)  
6109-1971 Edible sesame flour (expeller pressed)  
7021-1973 Protein rich foods supplements for infants and preschool children  
7481-1974 Method for determination of protein efficiency ratio (PER)  
7482-1974 Protein-based beverages  
7487-1974 Protein rich biscuits  
7835-1975 Edible low-fat soya flour  
7836-1975 Edible medium-fat soya flour  
7837-1975 Edible full-fat soya flour  
8211-1976 Edible soya protein isolate  
8212-1976 Edible groundnut protein isolate  
8220-1976 Protein rich concentrated nutrient supplementary foods  
8222-1976 Edible leaf protein concentrate

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